

What is claimed is:

1. A method of a continuous speech recognition system for discriminatively training hidden Markov models, the method comprising:  
5 performing segmentation and recognition of speech training data using a first set of recognition models so as to form a first model reference state sequence, and a set of first model hypothesis state sequences; mapping states in the first model reference state sequence to corresponding states in a second set of recognition models so as to  
10 form a second model reference state sequence; mapping states in the set of first model hypothesis sequences to corresponding states in the second set of recognition models so as to form a set of second model hypothesis sequences; and discriminatively training selected model states in the second set of  
15 recognition models using the mapped state sequences.
2. A method according to claim 1, wherein the hypothesis state sequences are represented by a lattice structure.
- 20 3. A method according to claim 1, wherein the first set of recognition models are detailed match models, and the second set of recognition models are fast match models.
4. A method of a continuous speech recognition system for discriminatively  
25 training hidden Markov models, the method comprising:

for a mixture component of a hidden Markov model state, calculating a gradient adjustment of the standard deviation of the mixture component, and

- 5       i.     if the calculated gradient adjustment is greater than a first threshold amount, performing an adjustment of the standard deviation of the mixture component using the first threshold, or
- ii.    if the calculated gradient adjustment is less than a second threshold amount, performing an adjustment of the standard deviation of the mixture component using the second threshold, or
- 10       else
- iii.   performing an adjustment of the standard deviation of the mixture component using the calculated gradient adjustment.

5. A method of a continuous speech recognition system for discriminatively
- 15   training hidden Markov models, the method comprising:
- determining correctness of a hypothesized word using pronunciation of the hypothesized word and a corresponding word in a reference text.